

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/930,914	YAMAGUCHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Fred Ferris	2128	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 19 November 2005.
2. ☒ The allowed claim(s) is/are 1,4,6 and 9.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

### **DETAILED ACTION**

1. *A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 September 2005 has been entered. With the amendment of 19 November 2005, applicants have now cancelled claims 2-3, 5, 7-8, and 10-15. Claims 1, 4, 6, and 9 are currently pending in this application and have now been allowed over the prior art of record.*

### **Response to Arguments**

2. *Applicant's arguments filed 19 November 2005 have been fully considered and found to be persuasive.*

*Regarding applicant's response to 101 rejections:* *The examiner withdraws the 101 rejection in view of applicant's amendment to the claims filed 19 November 2005.*

*Regarding applicant's response to 102(b) and 103(a) rejections:* *The examiner withdraws the previous 102/103 rejections in view of applicant's amendment to the claims, cancellation of claims 2-3, 5, 7-8, and 10-15, and arguments filed 19 November 2005.*

**Allowable Subject Matter**

3. Claims 1, 4, 6, and 9 are allowed over the prior art of record.

The following is an examiner's statement of reasons for allowance:

Applicants are disclosing a method and computer program product for designing a blade (airfoil) shape having operational stability by optimizing objective functions relating to lift/drag ration, blade load, Mach pressure distribution, maximum surface blade slope, pressure loss coefficient, and trailing edge deviation angel using Pareto optimization. This has been disclosed in the prior art of record.

While these elements are individually disclosed in the prior art, the prior art of record does not meet the conditions as suggested in MPEP section 2132, namely:

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an ***ipsissimis verbis*** test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."

In particular, the prior art does not disclose the specific elements inclusive of determining the incidence toughness for first and second evaluation values of a parameter at first and second incident angle having opposite signs about the incident angle with respect to a specific design point on the blade. Here the examiner has interpreted the term incidence toughness as defined in applicants specification on page 9, line 1 to page 12, line 18, page 24, line 1 to page 25, lien 18, and in Figures 5, 6, and

9. The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

- "Multi-Objective Optimization of Turbomachinery Cascades for Minimum Loss, Maximum Loading, and Maximum Gap-to-Chord Ratio", Dennis et al: Teaches optimization analysis of turbine compressor blade shapes where the optimization analysis is performed on objective functions using Pareto optimization including finding the Pareto solution by trade-of relationships between the objectives and Pareto ranking in the design of turbine compressor blade shapes. However, Dennis does not explicitly disclose the element of determining the incidence toughness for first and second evaluation values of a parameter at first and second incident angle having opposite signs about the incident angle with respect to a specific design point on the blade.
- "An Updated Survey of GA-Based Multiobjective Optimization Techniques", C.A. Coello: Teaches optimized objective functions and using Pareto optimization use of MOGA techniques and Pareto ranking in the design of turbine compressor blade shapes, but again, does not explicitly disclose the element of determining the incidence toughness for first and second evaluation values of a parameter at first and second incident angle having opposite signs about the incident angle with respect to a specific design point on the blade.

*The features noted above therefore render the claimed invention non-obvious over the prior art of record. Dependent claims 4 and 9 are deemed allowable as depending from independent claims 1 and 6 respectively.*

*It is further noted that the examiner has given patentable weight to the preamble of independent claims 1 and 6 since, in this case, the preamble limits the body of the claims.*

*MPEP 2163 recites the following:*

*“The examiner should evaluate each claim to determine if sufficient structures, acts, or functions are recited to make clear the scope and meaning of the claim, including the weight to be given the preamble. See, e.g., Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995) (“[A] claim preamble has the import that the claim as a whole suggests for it.”); Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989) (The determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application “to gain an understanding of what the inventors actually invented and intended to encompass by the claim.”).”*

*In this case, the preamble recitation of “incidence toughness that indicates operation stability of the blade” and “optimizing a plurality of objective functions” is further defined in the body of the claim as determining the incidence toughness for first and second evaluation values of a parameter at first and second incident angle having opposite signs about the incident angle with respect to a specific design point on the blade, and selecting Pareto solutions for the optimization analysis for optimal relationship between objective functions respectively.*

*Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably*

*accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."*

**Conclusion**

4. *Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached at 571-272-2279. The Official Fax Number is: (703) 872-9306*

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